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Oak Ridge, Tennessee

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ORNL
CENTRAL FILES NUMBER
62-2-79

COPY NO. 1.

DATE: February 27, 1962

SUBJECT: Radioactivity in Clinch River Water

TO: A. F. Becher

FROM: K. Z. Morgan

NOTICE

A. F. Becher
UCNC
ORGDP

February 27, 1962

Health Physics Division

W. H. Jordan
F. R. Bruce
W. S. Snyder
J. C. Hart
D. M. Davis
E. D. Gupton
J. A. Cox
W. D. Cottrell
Laboratory Records

Radioactivity in Clinch River Water

Enclosed, Table I, are the results of analysis of the weekly composite Clinch River samples which were collected at the ORGDP water filtration plant intake, by ORGDP personnel, for ORNL. $(MPC)_w$ values for the mixture have been calculated and are included in this table. Also enclosed, Tables II and III respectively, are the dilution factors in the Clinch River during the period 1/1/62 - 1/28/1962 and the radiochemical analysis of White Oak Lake effluent, January 1962.

K. Z. Morgan

K. Z. Morgan, Director
Health Physics Division

KZM:JCH:dw

Enclosures

February 27, 1962

To: D. M. Davis
J. C. Hart

From: Environmental Monitoring Groups

Subject: Radioactivity in Clinch River Water

The attached tables list the Radioactivity in the Clinch River at ORGDP Filtration Plant, the Weekly Dilution Factors in the Clinch River, and the Radiochemical Analysis Data for White Oak Lake Effluent for the month of January. The average activity level in the river was not significantly different from that of last month. A total of 254 curies of radioactivity were discharged over White Oak Dam during this period.

W. D. Cottrell
W. D. Cottrell

WDC:dw

Attachments

cc: H. H. Abee
E. D. Gupton

TABLE I

RADIOACTIVITY IN THE CLINCH RIVER AT ORGDP FILTRATION PLANT

January, 1962

Sample No.	Week Ending	Gross Beta c/m/ml[a]	Gross Alpha c/m/ml[b]	Sr_8Beta 10^{-8} µc/cc	Ru_6Beta 10^{-6} µc/cc	$(MPC)_w$[c] 10^{-6} µc/cc	% $(MPC)_w$
G-93	1-8-62	0.19 ± 0.008	0.01	0.90 ± 0.18	0.62 ± 0.013	3.84	15.3
G-94	1-15-62	0.06 ± 0.005	0.01	0.90 ± 0.14	0.20 ± 0.007	1.73	10.7
G-95	1-22-62	0.20 ± 0.01	0.01	0.90 ± 0.14	0.72 ± 0.011	3.80	16.2
G-96	1-29-62	0.17 ± 0.005	0.01	1.08 ± 0.14	0.61 ± 0.013	3.11	16.8

[a] Gross beta counted at 14.6% geometry based on Ru^{106} as a standard.

[b] Gross alpha counted at 52% geometry.

[c] Maximum permissible concentration for populations in the neighborhood of a controlled area.

TABLE II

Dilution Factor in the Clinch River During the Period 1/1/62 - 1/28/62

Week Ending	Weekly Average
1-7-62	254
1-14-62	556
1-21-62	191
1-28-62	175

TABLE III

Radiochemical Analyses of White Oak Lake Effluent
January 1962

Isotope	% of Total
Ru^{106}	92.23
Zr^{95}	1.1
Tre-Ce	0.94
Cs^{137}	0.71
I^{131}	0.01
Ce^{144}	0.03
Nb^{95}	3.68
Ba^{140}	0.03
Co^{60}	0.28
Sr^{89}	0.10
Sr^{90}	0.85

Gross Beta 123 d/m/ml

Beta Identified 143 d/m/ml

X-822

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ORNL
CENTRAL FILES NUMBER
62-3-91

DATE: March 27, 1962

COPY NO. 1

SUBJECT: Radioactivity in Clinch River Water

TO: A. F. Becher

FROM: K. Z. Morgan

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NOTICE

HEALTH PHYSICS DIVISION

RADIOACTIVITY IN CLINCH RIVER WATER

February 1962

Enclosed, Table I, are the results of analysis of the weekly composite Clinch River samples which were collected at the ORGDP water filtration plant intake, by ORGDP personnel, for ORNL. $(MPC)_w$ values for the mixture have been calculated and are included in this table. Also enclosed, Tables II and III respectively, are the dilution factors in the Clinch River during the period 1/28/62 - 2/25/62 and the radiochemical analysis of White Oak Lake effluent, February, 1962. The per cent of maximum permissible concentration in the river was not significantly different from last month. A total of 217 curies of radioactivity was discharged over White Oak Dam during this period.

TABLE I

RADIOACTIVITY IN THE CLINCH RIVER AT ORGDP FILTRATION PLANT

February, 1962

Sample No.	Week Ending	Gross Beta c/m/ml[a]	Gross Alpha c/m/ml[b]	Sr Beta 10^{-8} µc/cc	Ru Beta 10^{-6} µc/cc	$(MPC)_w$[c] 10^{-6} µc/cc	% $(MPC)_w$
G-97	2-5-62	0.04 ± 0.005	0.01	0.95 ± 0.13	0.14 ± 0.004	1.30	10.4
G-98	2-12-62	0.07 ± 0.004	0.01	0.90 ± 0.14	0.22 ± 0.005	1.96	11.0
G-99	2-19-62	0.06 ± 0.006	0.01	0.90 ± 0.14	0.15 ± 0.005	1.67	10.2
G-100	2-26-62	0.15 ± 0.006	0.01	1.17 ± 0.22	0.48 ± 0.009	2.86	16.5

[a] Gross beta counted at 14.6% geometry based on Ru^{106} as a standard.

[b] Gross alpha counted at 52% geometry.

[c] Maximum permissible concentration for populations in the neighborhood of a controlled area.

TABLE II

Dilution Factor in the Clinch River During the Period 1/28/62 - 2/25/62

Week Ending	Weekly Average
2-4-62	671
2-11-62	752
2-18-62	680
2-25-62	121

4 | 2224
556

TABLE III

Radiochemical Analyses of White Oak Lake Effluent
February, 1962

Isotope	% of Total
Ru^{106}	89.28
Zr^{95}	0.29
Tre-Ce	1.05
Cs^{137}	0.77
I^{131}	0.05
Ce^{144}	0.12
Nb^{95}	2.03
Ba^{140}	0.02
Co^{60}	5.07
Sr^{89}	0.14
Sr^{90}	1.17

Gross Beta 123 d/m/ml

TABLE I

RADIOACTIVITY IN THE CLINCH RIVER AT ORGDP FILTRATION PLANT

February, 1962

ORGDP μc/cc	Sample No.	Week Ending	Gross Beta c/m/ml[a] ORNL	Gross Alpha c/m/ml[b]	ORGDP	Sr Beta 10^{-8} μc/cc ORNL	Ru Beta 10^{-6} μc/cc	Σ (MPC)$_w$[c] 10^{-6} μc/cc	% (MPC)$_w$
4.5×10^{-8}	G-97	2-5-62	12.2 × 10^{-8} μc/cc 0.04 ± 0.005	0.01	0.90	0.95 ± 0.13	0.14 ± 0.004	1.30	10.4
0×10^{-8}	G-98	2-12-62	21.0 × 10^{-8} μc/cc 0.07 ± 0.004	0.01	0.54	0.90 ± 0.14	0.22 ± 0.005	1.96	11.0
5×10^{-8}	G-99	2-19-62	18.5 × 10^{-8} μc/cc 0.06 ± 0.006	0.01	0.54	0.90 ± 0.14	0.15 ± 0.005	1.67	10.2
7×10^{-8}	G-100	2-26-62	45.9 × 10^{-8} μc/cc 0.15 ± 0.006	0.01	0.86	1.17 ± 0.22	0.48 ± 0.009	2.86	16.5

a Gross beta counted at 14.6% geometry based on Ru^{106} as a standard.

b Gross alpha counted at 52% geometry.

c Maximum permissible concentration for populations in the neighborhood of a controlled area.

Total Beta

ORGDP = 1.42 × ORNL

Sr β

ORGDP = 73% ORNL

(1 liter samples)

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ORNL
CENTRAL FILES NUMBER
62-4-68

COPY NO. 1

DATE: April 27, 1962

SUBJECT: Radioactivity in Clinch River Water

TO: A. F. Becher

FROM: K. Z. Morgan

DISTRIBUTION

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NOTICE

To: D. M. Davis
J. C. Hart

From: Environmental Monitoring Group

Subject: Radioactivity in Clinch River Water

Enclosed, Table I, are the results of analysis of the weekly composite Clinch River samples which were collected at the ORGDP water filtration plant intake, by ORGDP personnel, for ORNL. $(MPC)_w$ values for the mixture have been calculated and are included in this table. Also enclosed, Tables II and III respectively, are the dilution factors in the Clinch River during the period 2/25/62 - 4/1/62 and the radiochemical analysis of White Oak Lake effluent, March 1962. The per cent of maximum permissible concentration in the river reached a value of 27% during the week ending 4/1/62. This was a result of zero discharge of water from Norris Dam during six days of this week. A total of 261 curies of radioactivity was discharged over White Oak Dam during the month of March.

W. D. Cottrell

WDC:dw

Attachments

TABLE I

RADIOACTIVITY IN THE CLINCH RIVER AT ORGDP FILTRATION PLANT

March, 1962

Sample No.	Week Ending	Gross Beta c/m/ml[a]	Gross Alpha c/m/ml[b]	Sr Beta 10^{-8} μc/cc	Ru Beta 10^{-6} μc/cc	$(MPC)_w$[c] 10^{-6} μc/cc	% $(MPC)_w$
G-101	3-4-62	0.096 ± 0.005	0.019	1.04 ± 0.14	0.29 ± 0.009	2.28	13.0
G-102	3-11-62	0.05 ± 0.004	0.019	0.81 ± 0.14	0.14 ± 0.004	1.66	9.3
G-103	3-18-62	0.03 ± 0.003	0.019	0.90 ± 0.14	0.08 ± 0.005	1.02	9.0
G-104	3-25-62	0.05 ± 0.004	0.019	1.35 ± 0.14	0.14 ± 0.004	1.07	14.4
G-105	4-1-62	0.27 ± 0.008	0.019	1.85 ± 0.13	0.86 ± 0.015	3.05	27.3

[a] Gross beta counted at 14.6% geometry based on Ru^{106} as a standard.

[b] Gross alpha counted at 52% geometry.

[c] Maximum permissible concentration for populations in the neighborhood of a controlled area.

TABLE II

Dilution Factor in the Clinch River During
the Period 2/25/62 - 4/1/62

Week Ending	Weekly Average
3-4-62	220
3-11-62	671
3-18-62	1020
3-25-62	467
4-1-62	97

5/2475
495

TABLE III

Radiochemical Analyses of White Oak Lake Effluent
March, 1962

Isotope	% of Total
Ru^{106}	96.94
Zr^{95}	0.22
Tre-Ce	0.57
Cs^{137}	0.30
I^{131}	0.02
Ce^{144}	0.14
Nb^{95}	0.45
Ba^{140}	0.02
Co^{60}	0.76
Sr^{89}	0.08
Sr^{90}	0.49

Gross Beta 158 d/m/ml